

Amendments to the Specification

Please replace the paragraph on Page 1, starting at line 1 which starts with "The present application is a Divisional" with the following amended paragraph:

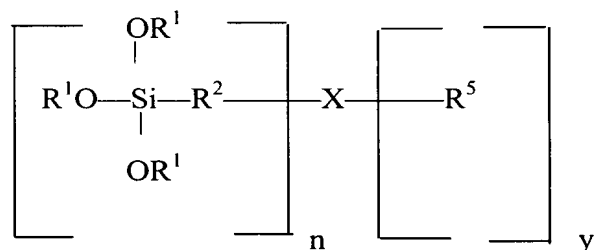
The present application is a Divisional of U.S. Application Serial No. 10/163,033 filed June 5, 2002 and issued on June 29, 2004 as U.S. Patent No. 6,756,079, which is a Divisional of U.S. Application Serial No. 09/356,912 filed July 19, 1999 and issued on July 9, 2002 as U.S. Patent No. 6,416,869. The entire disclosures of which are hereby incorporated by reference.

Please replace the paragraph on Page 5, starting at line 12 which starts with "The foregoing objects, in accordance" with the following amended paragraph:

The foregoing objects, in accordance with one aspect of the present invention, are provided by a method of treating a metal substrate, comprising:

- (a) providing a metal substrate; and
- (b) applying a coating of a silane composition onto the metal substrate, the silane composition comprising at least one substantially unhydrolyzed aminosilane which has one or more secondary or tertiary amino groups.

Suitable aminosilanes include:



wherein:

-n is either 1 or 2;

-y = (2-n);

-each R¹ is individually chosen from the group consisting of: C₁ - C₂₄ alkyl and C₂ - C₂₄ acyl;

-each R² is individually chosen from the group consisting of: substituted aliphatic groups, unsubstituted aliphatic groups, substituted aromatic groups, and unsubstituted aromatic groups;

-R⁵ is chosen from the group consisting of: hydrogen, C₁ - C₁₀ ~~alkylene~~ alkyl, C₁ - C₁₀ ~~alkylene~~ alkyl substituted with one or more amino groups, C₁ - C₁₀ ~~alkylene~~ alkyl, C₁ - C₁₀

~~alkylene alkyl~~ substituted with one or more amino groups, ~~arylene aryl~~, and ~~alkylarylene alkylaryl~~;

-X is either:



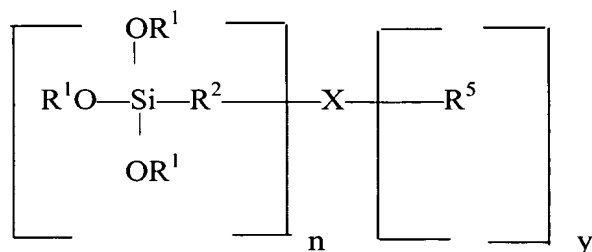
-wherein each R³ is individually chosen from the group consisting of: hydrogen, substituted and unsubstituted aliphatic groups, and substituted and unsubstituted aromatic groups; and

-R⁴ is chosen from the group consisting of: substituted and unsubstituted aliphatic groups, and substituted and unsubstituted aromatic groups; and

wherein, when n=1, at least one of the R³ and the R⁵ is not hydrogen (else the aminosilane would contain no secondary or tertiary amino group).

Please replace the paragraph on Page 22, starting at line 17 which starts with “The aminosilanes which may be applied” with the following amended paragraph:

The aminosilanes which may be applied to a metal substrate in an unhydrolyzed state include aminosilanes having at least one secondary or tertiary amino group. Suitable unhydrolyzed aminosilanes include:



wherein n is either 1 or 2. Thus, when a bis-silyl aminosilane of the type described previously is employed, n=2. Each R¹ is as defined previously, each R² is as described previously, and X is as described previously. R⁵ may be hydrogen, C₁ - C₁₀ ~~alkylene alkyl~~, C₁ - C₁₀ ~~alkylene alkyl~~ substituted with one or more amino groups, C₁ - C₁₀ ~~alkylene alkyl~~, C₁ - C₁₀ ~~alkylene alkyl~~ substituted with one or more amino groups, ~~arylene aryl~~, and ~~alkylarylene alkylaryl~~. When n=1, R³ and R⁵ should not all be hydrogen (else the aminosilane will have no secondary or tertiary aminosilane groups). Particularly preferred aminosilanes include the bis-silyl aminosilanes (i.e., n=2, y=0) described previously, as well as diamino silanes. Suitable diaminosilanes include those silanes having at least one trialkoxysilyl or triacetoxysilyl group, as well as two amino groups, at least one of which is a secondary amino group. Suitable diamino silanes include

N-[2-(vinylbenzylamino)ethyl]-3-aminopropyltrimethoxy (“SAAPS”), aminoethyl-aminopropyltrimethoxy silane (“AEPS”), and bis-(triethoxysilylpropyl)ethylene diamine (a bis-silyl, diamino silane).